

Unit 9 Day 1 p136 : 11-26 (all)

⑪ I ⑫ the student did not substitute his/her values for t back into let stmt.

⑬ The second solution ($x = -1$) must get eliminated because the square root of a # is never \ominus .

⑭ $2x^2 - 9x - 5 \neq 0$
 $(2x + 1)(x - 5) \neq 0$
 $2x + 1 = 0 \quad | \quad x - 5 = 0$
 $2x = -1 \quad | \quad x = 5$
 $x = -\frac{1}{2}$
 $\{x \neq -\frac{1}{2}, x \neq 5\}$

⑮ $m^4 + 2m^2 - 15 = 0$
 let $x = m^2$
 $x^2 + 2x - 15 = 0$
 $(x + 5)(x - 3) = 0$
 $x + 5 = 0 \quad | \quad x - 3 = 0$
 $x = -5 \quad | \quad x = 3$
 $-5 = m^2 \quad | \quad 3 = m^2$
 $\pm\sqrt{3} = m \quad | \quad \pm\sqrt{3} = m$
 $\pm i\sqrt{3} = m$
 $\{-\sqrt{3}, \sqrt{3}, -i\sqrt{3}, i\sqrt{3}\}$

⑯ $3k^4 + 10k^2 - 25 = 0$
 let $x = k^2$

$3x^2 + 10x - 25 = 0$
 $(3x - 5)(x + 5) = 0$
 $3x - 5 = 0 \quad | \quad x + 5 = 0$
 $3x = 5 \quad | \quad x = -5$
 $x = \frac{5}{3} \quad | \quad x = -5$
 $\frac{5}{3} = k^2 \quad | \quad k^2 = -5$
 $\pm\sqrt{\frac{5}{3}} = k \quad | \quad k = \pm i\sqrt{5}$

$k = \pm \frac{\sqrt{15}}{3} \quad \left\{ \frac{\sqrt{15}}{3}, -\frac{\sqrt{15}}{3}, i\sqrt{5}, -i\sqrt{5} \right\}$

⑰ $2r^4 - 7r^2 + 5 = 0$
 let $x = r^2$
 $2x^2 - 7x + 5 = 0$
 $(2x - 5)(x - 1) = 0$
 $2x - 5 = 0 \quad | \quad x - 1 = 0$
 $2x = 5 \quad | \quad x = 1$
 $x = \frac{5}{2} \quad | \quad r^2 = 1$
 $r^2 = \frac{5}{2} \quad | \quad r = \pm 1$
 $r = \pm \frac{\sqrt{10}}{2} \quad \left\{ \frac{\sqrt{10}}{2}, -\frac{\sqrt{10}}{2}, 1, -1 \right\}$
 $r = \pm \frac{\sqrt{10}}{2}$

⑱ $4x^4 - 8x^2 + 3 = 0$ let $x^2 = y$

$4y^2 - 8y + 3 = 0$
 $(2y - 3)(2y - 1) = 0$
 $2y - 3 = 0 \quad | \quad 2y - 1 = 0$
 $2y = 3 \quad | \quad 2y = 1$
 $y = \frac{3}{2} \quad | \quad y = \frac{1}{2}$

$y = \frac{3}{2} \quad | \quad y = \frac{1}{2}$
 $x^2 = \frac{3}{2} \quad | \quad x^2 = \frac{1}{2}$
 $x = \pm \frac{\sqrt{6}}{2} \quad | \quad x = \pm \frac{\sqrt{2}}{2}$

$\left\{ \frac{\sqrt{6}}{2}, -\frac{\sqrt{6}}{2}, \frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2} \right\}$

⑲ $(g-2)^2 - 6(g-2) + 8 = 0$ let $x = g-2$
 $x^2 - 6x + 8 = 0$
 $(x-2)(x-4) = 0$
 $x-2 = 0 \quad | \quad x-4 = 0$
 $x = 2 \quad | \quad x = 4$
 $g-2 = 2 \quad | \quad g-2 = 4$
 $g = 4 \quad | \quad g = 6$
 $\{4, 6\}$

⑳ $(p+2)^2 - 2(p+2) - 15 = 0$ let $x = p+2$
 $x^2 - 2x - 15 = 0$
 $(x-5)(x+3) = 0$
 $x-5 = 0 \quad | \quad x+3 = 0$
 $x = 5 \quad | \quad x = -3$
 $p+2 = 5 \quad | \quad p+2 = -3$
 $p = 3 \quad | \quad p = -5$
 $\{3, -5\}$

㉑ $6(k+2)^4 - 11(k+2)^2 + 4 = 0$ let $x = (k+2)^2$
 $6x^2 - 11x + 4 = 0$
 $(3x-4)(2x-1) = 0$
 $3x-4 = 0 \quad | \quad 2x-1 = 0$
 $3x = 4 \quad | \quad 2x = 1$
 $x = \frac{4}{3} \quad | \quad x = \frac{1}{2}$
 $(k+2)^2 = \frac{4}{3} \quad | \quad (k+2)^2 = \frac{1}{2}$
 $k+2 = \pm \frac{2}{\sqrt{3}} \quad | \quad k+2 = \pm \sqrt{\frac{1}{2}}$
 $k = -2 \pm \frac{2\sqrt{3}}{3} \quad | \quad k = -2 \pm \frac{\sqrt{2}}{2}$
 $k = \frac{-6 \pm 2\sqrt{3}}{3} \quad | \quad k = \frac{-4 \pm \sqrt{2}}{2}$

$\left\{ \frac{-6 \pm 2\sqrt{3}}{3}, \frac{-4 \pm \sqrt{2}}{2} \right\}$

Unit 9 Day 1 continued

22) $8(m-4)^4 - 10(m-4)^2 + 3 = 0$ let $x = (m-4)^2$

$$8x^2 - 10x + 3 = 0$$

$$x = \frac{1}{2}$$

$$x = \frac{3}{4}$$

$$(m-4)^2 = \frac{1}{2}$$

$$(m-4)^2 = \frac{3}{4}$$

$$\left\{ \frac{8 \pm \sqrt{2}}{2}, \frac{8 \pm \sqrt{3}}{2} \right\}$$

$$(2x-1)(4x-3) = 0$$

$$\begin{array}{l|l} 2x-1=0 & 4x-3=0 \\ 2x=1 & 4x=3 \\ x=\frac{1}{2} & x=\frac{3}{4} \end{array}$$

$$m-4 = \pm \sqrt{\frac{1}{2}}$$

$$m-4 = \pm \sqrt{\frac{3}{4}}$$

$$m = 4 \pm \frac{\sqrt{2}}{2}$$

$$m = 4 \pm \frac{\sqrt{3}}{2}$$

$$m = \frac{8 \pm \sqrt{2}}{2}$$

$$m = \frac{16 \pm 2\sqrt{3}}{4}$$

$$m = \frac{8 \pm \sqrt{3}}{2}$$

23) $7p^{-2} + 19p^{-1} = 6$

let $x = p^{-1}$

$$x = \frac{2}{7}$$

$$x = -3$$

$$\left\{ \frac{7}{2}, -\frac{1}{3} \right\}$$

$$7x^2 + 19x - 6 = 0$$

$$(7x-2)(x+3) = 0$$

$$p^{-1} = \frac{2}{7}$$

$$p^{-1} = -3$$

$$p = \frac{7}{2}$$

$$p = -\frac{1}{3}$$

$$7x-2=0$$

$$x+3=0$$

$$7x=2$$

$$x=-3$$

$$x = \frac{2}{7}$$

24) $5k^{-2} - 43k^{-1} = 18$

let $x = k^{-1}$

$$x = \frac{2}{5}$$

$$x = 9$$

$$\left\{ -\frac{5}{2}, \frac{1}{9} \right\}$$

$$5x^2 - 43x - 18 = 0$$

$$(5x+2)(x-9) = 0$$

$$k^{-1} = -\frac{2}{5}$$

$$k^{-1} = 9$$

$$k = -\frac{5}{2}$$

$$k = \frac{1}{9}$$

$$5x+2=0$$

$$x-9=0$$

$$5x=-2$$

$$x=9$$

$$x = -\frac{2}{5}$$

25) $(r-1)^{2/3} + (r-1)^{1/3} - 12 = 0$

let $x = (r-1)^{1/3}$

$$x^2 + x - 12 = 0$$

$$(x+4)(x-3) = 0$$

$$x+4=0$$

$$x-3=0$$

$$x = -4$$

$$x = 3$$

$$(r-1)^{1/3} = -4$$

$$(r-1)^{1/3} = 3$$

$$[(r-1)^{1/3}]^3 = (-4)^3$$

$$[(r-1)^{1/3}]^3 = 3^3$$

$$r-1 = -64$$

$$r-1 = 27$$

$$r = -63$$

$$r = 28$$

$$\{-63, 28\}$$

26) $(y+3)^{2/3} - 2(y+3)^{1/3} - 3 = 0$

let $x = (y+3)^{1/3}$

$$x^2 - 2x - 3 = 0$$

$$(x-3)(x+1) = 0$$

$$x-3=0$$

$$x+1=0$$

$$x = 3$$

$$x = -1$$

$$(y+3)^{1/3} = 3$$

$$[(y+3)^{1/3}]^3 = (3)^3$$

$$y+3 = 27$$

$$y = 24$$

$$(y+3)^{1/3} = -1$$

$$[(y+3)^{1/3}]^3 = (-1)^3$$

$$y+3 = -1$$

$$y = -4$$

$$\{24, -4\}$$